



HEALTH AND SAFETY PLAN
FORMER WEST PULLMAN WORKS SITE
1015 WEST 120TH STREET
CHICAGO, ILLINOIS

VOLUME II OF III

June 1996

Prepared for:

Navistar International Transportation Corp.
Chicago, Illinois

Prepared by:

Geraghty & Miller, Inc.
Chicago, Illinois



VOLUME II OF III

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FORMER WEST PULLMAN WORKS SITE
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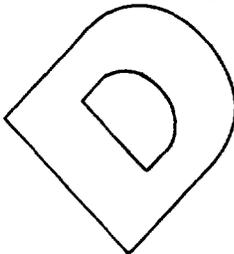
Approval

Date

Geraghty & Miller Project Manager

Geraghty & Miller Health & Safety Coordinator

Geraghty & Miller Site Safety Officer



**HEALTH AND SAFETY PLAN
FORMER WEST PULLMAN WORKS SITE
1015 WEST 120TH STREET
CHICAGO, ILLINOIS**

PROJECT NAME: Former West Pullman Works Site

PROJECT LOCATION: Chicago, Illinois

CLIENT: Navistar International Transportation Corp.

SITE DESCRIPTION: Former West Pullman Works Site is located at 1015 West 120th Street in the City of Chicago, Cook County, Illinois.

WORK DESCRIPTION:

- Collection of soil samples in select identified areas of concern (AOC) for laboratory analysis.
- Confirmation of the presence or absence of any suspected underground storage tanks (USTs) or other subsurface structures.
- Determination of nature of contents of existing USTs and thickness of oil-type substances present in subsurface structures at the site.
- An initial assessment of the potential conduits and sources of oil-type substances observed in subsurface structures.
- Sample collection of impacted building materials, oil-type substances, asbestos containing materials, and smoke stack ash for waste characterization

WORK SCHEDULE: Summer/Fall 1996

PRIME CONTRACTOR: Geraghty & Miller

PROJECT MANAGER: Martin J. Hamper

H & S COORDINATOR: Suzanne Klimasz

SITE SAFETY OFFICER: Geraghty & Miller Field Team Leader



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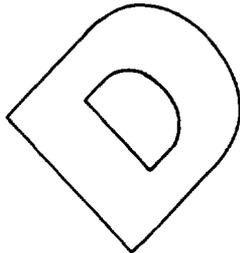


**HEALTH AND SAFETY PLAN
FORMER WEST PULLMAN WORKS SITE
1015 WEST 120TH STREET
CHICAGO, ILLINOIS**

1.0 INTRODUCTION

This health and safety plan (HSP) is developed for use during the on-site activities that will be conducted to gather data required to evaluate the environmental conditions at the Former West Pullman Works Site in Chicago, Illinois. The site activities will be performed under the Illinois Environmental Protection Agency (IEPA) voluntary Site Remediation Program (Program). The elements of the HSP pertain to the requirements outlined in the Occupational Safety and Health Administration (OSHA) Final Rule, 29 CFR Part 1910.120. The objective of this HSP is to ensure safe working conditions at the site. The protection of workers and environmental safety and health are major concerns and cannot be compromised. The safety organization and procedures have been established based on an analysis of potential hazards and personnel protection measures which have been selected in response to these risks.

To ensure the safety and health of workers and the general public, reasonable precautions will be taken by Geraghty & Miller, Inc. and its subcontractors. All work will be performed in accordance with the health and safety requirements described herein, and appropriate federal, state, and local health and safety regulations.



2.0 GERAGHTY & MILLER RESPONSIBILITY

Geraghty & Miller will be responsible for the adherence of its personnel to the HSP during activities at the Former West Pullman Works, and will ensure all work is performed in accordance with the current edition of OSHA rules for hazardous waste operations, and appropriate federal, state, and local health and safety regulations. Geraghty & Miller will also be responsible for the adherence of its subcontractors and site visitors during activities at the site.

The Geraghty & Miller Project Manager is ultimately responsible for ensuring that all project participants abide by the requirements outlined in this health and safety plan.

The Geraghty & Miller health and safety coordinator (HSC) will provide technical coordination and support of the health and safety program. The HSC will act in an advisory capacity to the site safety officer.

A site safety officer (SSO) will be assigned to the project during activities at the Former West Pullman Works. The SSO is responsible for field implementation and enforcement of the HSP. The SSO must conduct health and safety meetings with field personnel prior to any field activities, and provide all related documentation. Daily surveillance and monitoring will be conducted to ensure proper HSP implementation. The SSO will be familiar with all construction standards and methods, drilling and installation techniques, and sampling procedures. The SSO will have the authority to stop work if worker or public health are threatened by the aforementioned site operations, and may implement requirements in addition to those described hereon on a case-by-case basis. The SSO, HSC, and Geraghty & Miller Project Manager will take action to re-establish safe working conditions and safeguard site personnel, the public, and environment should an unforeseen or site-specific safety related factor, hazard, or condition become evident during site activities.



3.0 SITE DESCRIPTION

3.1 PHYSICAL SETTING AND LOCATION

The Former West Pullman Works is located at 1015 West 120th Street in the City of Chicago, Cook County, Illinois (Figure 1). Based on a site inspection and review of the United States Geological Survey (USGS) Blue Island, Illinois Quadrangle, 7.5 Minute Series topographic map, the general topography in the vicinity of the Former West Pullman Works is relatively flat at an elevation of approximately 610 feet above mean sea level (ft msl).

The Former West Pullman Works consists of an open, 21-acre parcel of land. The Former West Pullman Works was formerly the location of a manufacturing facility that supplied parts for tractors, trucks, farm implements, refrigerators, freezers, and industrial power products.

The facility was razed soon after the facility was closed in 1983, except for the smokestack associated with the boiler house which was demolished by the City of Chicago in May 1996. A general site layout is provided on Figure 2.

3.2 REGIONAL GEOLOGICAL/HYDROGEOLOGICAL SETTING

According to regional geologic information, the shallow surficial soils at the Former West Pullman Works consist of glacial soils deposited during the Woodfordian-Twocreekan-Valderan Substage of the Wisconsinan glaciation (Willman 1971). The shallow glacial soils at the Former West Pullman Works are part of an area mapped as Lake Plain. (Willman 1971). Lake Plain consists of the floors of glacial lakes flattened by wave erosion and by minor deposition in low areas. Lake Plain is largely underlain by glacial till with local deposits of silt, clay, and sand of the Equality Formation.

The bedrock below the surficial deposits is the Niagaran Series Racine Dolomite. In the vicinity of the Former West Pullman Works, the bedrock surface is at approximately 550 ft msl



(Willman 1971) and the land surface elevation is at approximately 610 ft msl. Therefore, the estimated depth to bedrock at the Former West Pullman Works is 60 feet below land surface (ft bls). The glacial till overlying the bedrock consists primarily of relatively impermeable clay.

The nearest surface water to the subject property is the Little Calumet River, which is located approximately 1 mile south of the Former West Pullman Works. Due to the presence of the Little Calumet River, it is believed that the direction of shallow groundwater flow in the vicinity of the Former West Pullman Works is towards the south. It is believed that the shallow groundwater table is encountered between 10 and 15 ft bls.

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4.0 POTENTIAL HAZARD AND RISK EVALUATION

Constant attention will be given to protecting on-site personnel from the chemical and physical hazards that may be encountered during site activities. An evaluation of potential hazards is based on site history, observations made by Geraghty & Miller during a visual site investigation on May 20, 1996, and the planned site activities.

4.1 PLANNED SITE ACTIVITIES

The planned field activities at the site will consist of the following:

- Collection of soil samples in select identified areas of concern (AOC) for laboratory analysis.
- Confirmation of the presence or absence of any suspected underground storage tanks (USTs) or other subsurface structures.
- Determination of nature of contents of existing USTs and thickness of oil-type substances present in subsurface structures at the site.
- An initial assessment of the potential conduits and sources of oil-type substances observed in subsurface structures.
- Sample collection of impacted building materials, oil-type substances, asbestos containing materials, and smoke stack ash for waste characterization analysis.

The Work Plan (Volume I) discusses the planned site activities in further detail.

4.2 CHEMICAL HAZARDS

The suspected chemical contamination at the Former West Pullman Works consist of volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PNAs), polychlorinated biphenyls (PCBs), metals (cadmium, chromium, copper, lead, nickel), cyanide, oleum, and sulfuric acid. The characteristics of the suspected chemical constituents are described in Attachment 1.



The following potential chemical exposure routes and hazards can be identified from the items listed above and other factors which may be encountered during field work at the site:

- Inhalation of contaminated materials (particles, vapors, or gases).
- Ingestion of contaminated materials (accidental/poor hygiene).
- Dermal contact with contaminated materials.
- Dermal contact with contaminated equipment and structures.

These hazards will be minimized by following the protocol for the designated working level of personal protection as described in Section 5.0, Personnel Protection Program.

4.3 PHYSICAL HAZARDS

The physical hazards which may be encountered during the planned field activities described above include:

- Noise Exposure
- Climbing Hazards
- Slip, Trip and Fall Hazards
- Lifting Hazards
- Flying Objects/Debris
- Lacerations and Contusions
- Heat Stress
- Cold Injury
- Underground Utilities Hazards
- Explosive Hazards
- Steam Burns
- Heavy Equipment Hazards



General considerations for these common physical hazards are discussed in the following sections.

4.3.1 Noise Exposure

The field team may be exposed to excessive noise levels from the drilling equipment, although this is not anticipated. Because drill rigs typically do not exceed the 85 dBA (decibels on the A scale) average, monitoring for a particular noise level will not be performed. If necessary, hearing protection may be worn during drilling activities on the site. The SSO will determine if hearing protection is required based on situation-specific conditions.

4.3.2 Climbing Hazards

In the course of the sampling activity, subcontractors may have to work on equipment by climbing on the equipment, or may have to climb over such items as inclines or mounds to obtain access to some areas. The drilling subcontractor will only perform climbing activities which conform with any applicable NIOSH and OSHA requirements.

4.3.3 Lifting Hazards

Subcontractors may be exposed to injury caused by lifting heavy objects due to the fact that drilling operations can involve manual movement of drilling casing, auger flights, and various other pieces of equipment. All field team members will be trained on the proper method used to lift heavy equipment and cautioned against lifting heavy objects that are too heavy for one person.

4.3.4 Lacerations and Contusions

The field team may cut or bruise themselves while conducting tasks associated with this project. Drilling and sampling activities usually involve contact with moving machinery and physical objects. A first aid kit must be present onsite, so that field personnel are prepared to



disinfect and bandage minor cuts and bruises. These first-aid materials will be sealed in individual packages, stored in a weatherproof container, and periodically inspected for completeness.

Serious contusions may result from falling objects, flying objects, or being caught between idle or moving pieces of machinery. Care will be taken to avoid these situations when working with heavy equipment. Hard hats will be used by the staff completing the field work.

4.3.5 Heat Stress

During this project, workers will be required to wear protective clothing which insulates the body. If heavy work is performed under high air temperatures, heat stress is likely to occur, especially when the protective clothing inhibits the body's ability to cool itself. Both heat exhaustion and heat stroke may occur. Heat-related stress is described in Section 6.2.1, Heat Stress Monitoring.

4.3.6 Cold Injury

Prolonged exposure to excessive cold or wet conditions may cause excessive loss of body heat (hypothermia) and/or frostbite. Ambient air temperature and wind velocity are two factors which influence the development of cold weather injuries. Cold-related stress is described in Section 6.2.2, Cold Stress Monitoring.



4.3.7 Underground Utilities

Whenever the ground is penetrated, the potential for cutting into utilities exists. A Geraghty & Miller representative will consult with local authorities about the location of underground utility lines (water, gas, electrical, telephone, cable television, etc.) during the planning/mobilization phase. Prior to the start of any field activities, utility lines will be clearly delineated in the selected area for work. All field personnel and workers will be explicitly informed of utility line locations.

4.3.8 Explosive Conditions

Explosive conditions may develop as a result of releasing volatile substances from buried, contained, or uncontained sources during drilling operations. Conditions will be monitored as described in Section 6.3, Breathing Zone Monitoring.

4.3.9 Steam Burns

Steam cleaning associated with decontamination procedures poses potential inhalation and skin hazards. Steam burns are a potential hazard, and thus, protective clothing will be worn during steam cleaning activities. Personnel who perform steam cleaning will wear full-faced air-purifying respirators if appropriate, as determined by the SSO.

4.3.10 Heavy Equipment Hazards

Heavy equipment setup and operation can pose many hazards, including slip, trip and fall hazards, being struck by flying debris/objects and being caught between a moving and idle object. The equipment operator is generally responsible for the safe operation of the equipment; however, personnel and site visitors must be aware of safety considerations associated with heavy equipment. Only those personnel properly trained to operate particular equipment may operate that equipment. Personnel and visitors must take care to stand at an appropriate distance from the



heavy equipment, and always wear the appropriate personal protective equipment. Refer to Section 8.2 Drilling Operations Safety for additional safety requirements.

4.4 BIOLOGICAL HAZARDS

Potential biological hazards that may be encountered during site work include, but are not limited to, insect bites/stings (including tick bites), animal bites, and snake bites. All field team members will be properly briefed regarding the potential for encountering wildlife, as well as prompt first aid procedures in the event of an insect, animal, or snake bite. Personnel will wear appropriate protective gear (e.g., long-sleeved shirts and heavy socks pulled over pants) to minimize the potential for bites and/or stings.

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5.0 PERSONNEL PROTECTION PROGRAM

A Personnel Protection Program has been established and will be maintained for all personnel working at the site. Geraghty & Miller will provide any necessary safety and health training to Geraghty & Miller personnel assigned to the site for the purposes, or for any other site investigation-related function. All subcontractors shall also be health and safety trained.

5.1 TRAINING REQUIREMENTS

Prior to the commencement of any on-site work, safety meetings will be conducted by the Site Safety Officer. Further, all Geraghty & Miller personnel, subcontractors, and others participating in field activities must meet training requirements outlined in the OSHA Standards contained in 29 CFR 1910.120 covering hazardous waste operations and emergency response. These requirements include an initial 40-hour training program consisting of classroom and hands-on experience in the use of personal protective equipment (PPE), safe operating practices, and the identification of potential hazards or hazardous situations, in accordance with the OSHA standards. All field personnel must attend eight hours of annual refresher training in addition to the 40-hour training program, and new employees must perform three days of work activity under the supervision of a trained and experienced work supervisor.

5.2 LEVELS OF PERSONAL PROTECTION

All activities will initially be performed in Level D PPE. Depending on results obtained from breathing zone monitoring (see Section 6.3, Breathing Zone Monitoring), this level of protection may be upgraded to Modified Level D or C. During the breathing zone sampling activities, Level D has been selected for the Personnel Protection Program. Upgrading to Level C may be recommended based on breathing zone monitoring results.

The respiratory protection program implemented during on-site activities will be done in accordance with 29 CFR Part 1910.134. A sustained reading above background levels of total photoionizable volatiles in the workplace breathing zone will trigger an upgrade in protection



from Modified Level D to Level C (see Section 6.3, Breathing Zone Monitoring). In areas of expected soil/groundwater contamination, breathing zone monitoring will be conducted with a PID; however, in areas of undefined contamination or during precipitation events/high humidity conditions, an FID will be utilized for monitoring purposes. Other data obtained during the project will be used to update the use of respiratory protective equipment. If other contaminants are encountered onsite, field personnel will be made fully aware of the hazards and the appropriate procedures which will be utilized to prevent exposure. Project personnel will always take precautions to avoid dermal and inhalation exposure and ingestion during all on-site work. The Geraghty & Miller Respiratory Protection Program, which details the use of respiratory protective equipment, is included as Attachment 2.

The levels of protection and associated equipment are defined as follows:

Level D

Level D PPE is worn during activities which do not suggest a need for any initial respiratory or extensive dermal protection. The equipment to be utilized includes:

work clothing as prescribed by weather
steel-toed, steel shank boots
hard hat
safety glasses
gloves: latex or nitrile
hearing protection (if necessary)

Modified Level D

Modified Level D PPE is worn during activities which do not suggest a need for any initial respiratory protection, but when dermal protection is warranted. The equipment to be utilized includes:



work clothing as prescribed by weather
Tyvek™ or poly-coated Tyvek™ coveralls (chemical resistant)
steel-toed, steel shank boots (chemical resistant)
hard hat
safety glasses
inner gloves: surgical type
outer gloves: nitrile for situations of expected contaminant concentrations,
SilverShield for situations of unverified site conditions
disposable booties
hearing protection (if necessary)

Level C

Level C is to be worn when dermal absorption or damage is possible and respiratory protection is necessary. Level C PPE includes:

work clothing prescribed by weather
poly-coated Tyvek™
steel-toed and shanked boots (chemical resistant)
hard hat
inner gloves: surgical type
outer gloves: nitrile for situations of expected contaminant concentrations,
SilverShield for situations of unverified site conditions
outer boot covers
full-face respirators with appropriate cartridges
hearing protection (if necessary)

The respiratory protection program for Level C includes the use of a NIOSH and OSHA-approved full-face respirator with appropriate cartridges. The respirators will be used when monitoring of the work place breathing zone indicates they are required. Level C work will always be done using the "buddy system." Respirators, if used, will be cleaned on a daily basis using clean, warm water and MSA™ Clean-Sanitizer. In addition, when respirators are used, the cartridges shall be replaced on a daily basis or more often if deemed necessary by the SSO.



5.3 LIMITATIONS OF PROTECTIVE CLOTHING

The designated PPE ensembles have been selected to provide protection against potential contaminants and physical hazards. However, no protective garment, glove, or boot is chemical proof, nor can it provide protection against all chemical types. Chemical permeation through the PPE is governed by contaminant concentrations, environmental conditions, physical conditions of the protective garment, and resistance of the garment to specific contaminants.

To obtain optimum performance from the PPE, the following procedures should be followed.

- When using coveralls, don a clean, new, garment after each rest break and at the beginning of each shift.
- Inspect all clothing, gloves, and boots prior to use for imperfect seams, non-uniform coating, tears, or poorly functional closures.
- Inspect reusable garments, boots, and gloves prior to and during use for visible signs for chemical permeation, swelling, discoloration, stiffness, brittleness, cracks, punctures, and any signs of abrasions.

Discard reusable garments, boots, or gloves exhibiting any of the aforementioned characteristics. In areas known to exhibit elevated concentrations of contaminants, PPE will not be reused.

5.4 DECONTAMINATION PROCEDURES

Decontamination is the process of removing or neutralizing contaminants from personnel or equipment. The decontamination process will prevent the transport of potentially harmful materials into unaffected areas. Decontamination also protects the worker from contaminants that have accumulated on PPE, vehicles, tools, and other equipment. Appropriate decontamination procedures will be followed by all personnel performing work tasks in an exclusion zone, regardless of the work task or protection level used. Decontamination personnel will also follow



proper decontamination procedures prior to leaving the decontamination zone. The following sections describe the decontamination procedures to be followed during field activities.

5.4.1 Level D Decontamination

The general decontamination procedures for workers in Level D conditions are described in the section below.

Station 1: Equipment Drop

Equipment used onsite (tools, sampling devices, and other potentially contaminated equipment) are left in the exclusion zone or on the drill rig during drilling activities.

Station 2: Gloves and Outer Garment Removal

Gloves will be scrubbed with the proper decontamination solution (Micro™ and distilled water or equivalent) or disposed of in plastic bags. Steel-toed boots will also be scrubbed with decontamination solution, if required. Hands and face should be washed as soon as possible.

5.4.2 Modified Level D Decontamination

The general decontamination procedures for workers in Modified Level D conditions are described in the section below.

Station 1: Equipment Drop

Equipment used onsite (tools, sampling devices, and other potentially contaminated equipment) are left in the exclusion zone or on the drill rig during drilling activities.

Station 2: Gloves and Outer Garment Removal

Outer gloves will be scrubbed with the proper decontamination solution (Micro™ and distilled water or equivalent) or disposed of in plastic bags; inner gloves will be disposed



of in plastic bags. Steel-toed boots will also be scrubbed with decontamination solution, if required. Outer garments (Tyvek, disposable booties) are removed at this station and deposited in plastic bags which will be stored in drums onsite pending laboratory analyses of sampled media. Hands and face should be washed as soon as possible.

5.4.3 Level C Decontamination

The full decontamination procedures for workers wearing Level C Protection are described in the sections below.

Station 1: *Segregated Equipment Drop*

Deposit equipment used onsite (tools, sampling devices and containers, monitoring instruments, radios, clip boards, etc.) on plastic drop cloths or in different containers with plastic liners. Segregation at the drop reduces the probability of cross-contamination.

Equipment: Various size containers
 Plastic liners
 Plastic drop cloths

Station 2: *Wash and Rinse Boots and Gloves*

Scrub outer boots and gloves with the proper decontamination solution (detergent/water). Rinse gloves and boots with hand pump spray bottle into plastic bucket.

Equipment: 2 containers (30-50 gallon)
 Hand spray pump device (garden sprayer)
 Water
 Detergent
 Scrub brushes

Station 3: *Outer Boot and Glove Removal*

Remove outer boots (if worn) and gloves with accompanying tape. Tape should be placed in a container with a plastic liner.



Equipment: 1 container (30-50 gallon)
Plastic liner
Bench

Station 4: *Cartridge Change*

If a worker leaves the exclusion zone only to change a cartridge on his/her respirator, this is the last step in the decontamination procedure. Once the worker's cartridge is exchanged, the outer glove and boot covers are donned with joints taped. The worker may then return to the exclusion zone.

Equipment: Respirator cartridges
Tape
Extra gloves
Boot covers (if worn)

Station 5: *Boots, Gloves and Outer Garment Removal*

Removal of boots, gloves (inner) and outer garment. The outer chemically resistant garment should be deposited in a plastic lined container.

Equipment: Container (30-50 gallon)
Bench or stool
Plastic liners

Station 6: *Respiratory Protection Removal*

Remove the face piece respirator, deposit used cartridges in a plastic lined container and wipe the face piece with clean water and paper towels.

Equipment: Container (30-50 gallon)
Plastic liners
Paper towels
Detergent solution
Rinse water



Station 7: *Field Wash*

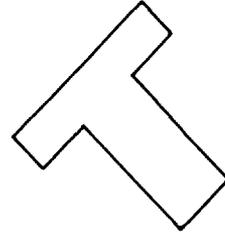
Wash hands and face

Equipment:

Water

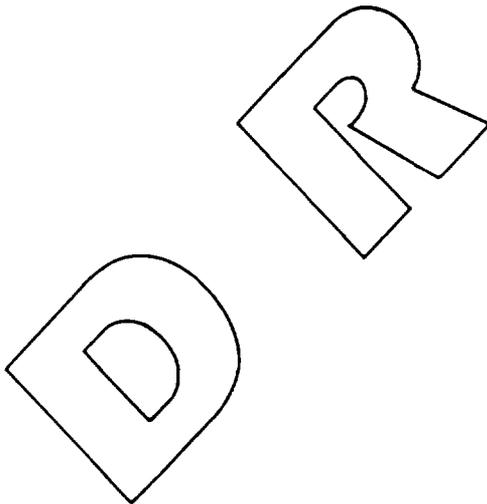
Soap

Wash basins/buckets



5.4.4 Equipment Decontamination

Decontamination of equipment will consist of preliminary removal of gross contamination, using a brush and detergent solution, and then rinsing with distilled water. All split-spoons, augers, and all other down-hole drilling/sampling equipment are to be thoroughly steam cleaned (or hot water pressure-washed) between use at different drilling locations. Steam cleaning will be conducted in a designated decontamination area. Large equipment (e.g., drilling rig, etc.) remaining on site, except down-hole drilling equipment, will not be decontaminated, but will be stored in the contaminated side of the decontamination station at the end of each day.



6.0 MEDICAL AND ENVIRONMENTAL SURVEILLANCE

6.1 HEALTH MONITORING

Geraghty & Miller has developed a health monitoring program in order to detect potential impacts resulting from exposure to chemicals. All Geraghty & Miller and subcontractor personnel onsite will have undergone a yearly physical examination as required in 29 CFR 1910.120(f). Geraghty & Miller employees are furnished with a copy of written opinion from the examining physician, including the results of the medical examination, tests, and physician's recommended limitations upon employees' assigned work. Geraghty & Miller employees receive yearly physicals consisting of the following:

- Personal, family and environmental history
- Hands-on physical examination
- Snellen's eye examination
- Chest X-ray (once every three years)
- Vision and color blindness testing
- Hemocult testing (over age 40)
- Pulmonary Function Test
- Audiometric Testing
- Electrocardiogram (EKG)
- Laboratory Testing
- Complete Blood Count

- Red Blood Count
- White Blood Count
- Differential Screening
- Hemoglobin
- Hematocrit

- Urinalysis

- Sugar
- Albumin
- Specific Gravity
- Microscopic

- Laboratory Chemistries



- A.G. Ratio
- Albumin
- Alkaline Phosphatase
- Bilirubin, Total
- Calcium
- Chloride
- Cholesterol
- Creatinine
- GGT
- Globulin
- Glucose
- Iron
- Lactic Dehydrogenase (LDH)
- Phosphorus
- Potassium
- Protein, Total
- SGOT
- SGPT
- Sodium
- Triglycerides
- Urea Nitrogen (BUN)
- Uric Acid
- Blood Lead Level
- Cadmium
- Mercury
- Zinc Protoporphyrin

6.2 WEATHER-RELATED STRESS CONTROL AND MONITORING

6.2.1 Heat Stress Monitoring

If heavy work is performed in conditions with high air temperatures, heat stress is likely to occur, especially when protective clothing inhibits the body's ability to cool itself. Heat stress is caused by several interacting factors, such as environmental conditions, clothing work load, physical condition, characteristics of the employee, and type of PPE required for the work task. Heat stress may be of concern when dry bulb air temperature exceeds 70 degrees Fahrenheit (°F). Both heat exhaustion and heat stroke may occur. Though less severe than heat stroke, heat exhaustion is indicated by symptoms such as pale and moist skin, heavy sweating, headache,



nausea, dizziness, and vomiting. Heat stroke, which is life-threatening, has symptoms of hot, red skin, very small pupils, very high body temperature, and a cessation of sweating.

To protect workers from heat stress, personnel must be monitored for the signs of heat stress. Also, the SSO must provide appropriate liquids for employees, and verify that employees are drinking more than the amount required to satisfy thirst. During hot weather, rest periods will be provided as needed to allow personnel to cool down. Rest periods should be taken as needed in a shaded area if possible and employees should remove protective clothing.

6.2.2 Cold Stress Monitoring

Excessive loss of body heat (hypothermia) and/or frostbite may be caused by prolonged exposure to excessive cold or wet conditions. The first cold weather-related injury is frostbite. Areas of the body which have high surface area-to-volume ratios such as fingers, toes, and ears are most susceptible to frostbite. Three categories of frostbite exist. Frost nip, or incipient frostbite, is characterized by a blanching or whitening of the skin. In the case of superficial frostbite, the skin has a waxy or white appearance and is firm to the touch, though the tissue beneath is resilient. Deep frostbite, which is an extremely serious injury, results in tissues that are cold, pale, and solid.

The second type of cold weather-related injury is hypothermia. The symptoms of systemic hypothermia, which is caused by exposure to freezing or rapidly dropping temperatures, are exhibited in five stages: 1) shivering, 2) apathy, listlessness, and sleepiness, 3) unconscious, glassy stare with a slow pulse and slow respiratory rate, 4) freezing of the extremities, and 5) death.

Persons exposed to temperatures at or below freezing or wind-chill temperatures of 10 °F may experience weather-related injuries in the forms of the previously described frostbite and hypothermia. The two factors that influence the development of a cold injury are ambient temperature and wind velocity. The term "wind chill" describes the chilling effects of moving air in combination with low temperatures. For example, 10 °F with a wind velocity of 15 miles per



hour (mph) is the equivalent in chilling effect of still air at -18 °F. In general, the greatest incremental increase in wind velocity occurs when a wind of 5 mph increases to 10 mph. Thus the dangers of cold-related stress on a cold, windy day is greater than on a cold day with little or no wind. Further, water conducts heat 240 times faster than air. Thus the body cools suddenly when chemical-protective equipment is removed if the clothing underneath is perspiration-soaked. The SSO will assess site-specific weather conditions to determine if it is appropriate for the site workers to remove protective clothing outdoors.

To minimize cold weather-related stresses, site workers should wear thermal socks, long cotton or thermal underwear, hard hat liners and other cold weather gear. Also, blankets, warm drinks other than caffeinated coffees, and warm break areas are essential. Finally, personnel must be briefed on the dangers of frostbite and hypothermia. Self-monitoring and co-worker monitoring will be highly encouraged.

6.2.3 Other Weather-Related Stresses

Serious hazards may result from adverse weather. The Geraghty & Miller SSO may decide to discontinue drilling or other field activity because of severe and threatening weather conditions including lightning, strong winds, heavy rain, and very hot temperatures.

6.3 BREATHING ZONE MONITORING

Breathing zone monitoring will be conducted during certain work tasks to protect field personnel from exposure to volatile substances, as well as to determine appropriate levels of personal protective equipment for the given work plan. Prior to the start-up of any work tasks, initial breathing zone monitoring will be performed. A baseline (ambient) breathing zone value will be determined by monitoring upwind. Air quality in the breathing zone will be evaluated by monitoring organic vapor levels. For this purpose, a photoionization detector (PID) which features a grounded detector and high humidity operation will be utilized. In the event of rain, a flame ionization detector (FID) will be utilized for breathing zone monitoring. This breathing



zone monitoring equipment will be calibrated daily according to manufacturer instructions. Throughout the drilling phase, monitoring readings will be collected near the borehole and within the breathing zone when the drill bit first penetrates ground surface, and, at a minimum, 15 minutes thereafter. Readings will also be taken during sampling to document that organic vapor readings are at background levels. The SSO may alter this schedule as new information is obtained regarding health hazards at the site.

Results of the monitoring, in addition to a knowledge of potential chemical hazards at the work site, will be used to determine when an "action level" for a particular location has been reached. The "action level" is the level of organic vapors that indicates a need to upgrade the level of PPE being used by personnel. If vapor concentrations approach action levels, continuous monitoring will be conducted, and all calibration and measurement information will be recorded in the field logbook. Refer to Attachment I for the threshold limit values (TLVs) for the respective compounds of concern.

Throughout activities, monitoring readings will be collected near the sample port/monitoring well head or work area and at the breathing zone, prior to initiating any activity and every 15 minutes thereafter. If organic vapor levels are zero (or background) at the start of activity, the 15-minute interval monitoring will not be required. If vapor concentrations approach action levels, continuous monitoring will be conducted. If activities are halted because of action level exceedances, the SSO will upgrade the level of personal protection to C (where respiratory protection is required), allow a 15-minute time interval to allow potential dispersion of organic vapors into the atmosphere, and collect additional monitoring readings both at the sample port/well head or work area and breathing zone. Based on the results of the additional monitoring, activities may be reinstated under conditions specified by the SSO (e.g., at an upgraded personal protection level).

At an area known to have hydrocarbon contamination, specific procedures must be followed. When breathing zone readings indicate that a worker is being exposed to a sustained



level (greater than 5 minutes duration) of 15 ppm (the STEL for benzene) above the ambient air level, air-purifying respirators (APR's) with organic vapor cartridges will be donned by all workers in the work area. At sustained levels of 500 ppm (IDLH for benzene), personnel will exit the work area until benzene levels decrease.

As stated previously in Section 5.2, Level of Personal Protection Level D will be the initial level of protection to be utilized throughout the drilling and sampling activities. If ambient breathing zone conditions exceed the background level of volatile organic vapors (VOC) vapors for a sustained period of ten minutes or more, Level D may be considered insufficient and all work will cease and options will be evaluated, including a potential upgrade to Level C. The personnel protection level may be downgraded by the SSO to Level D when all monitoring parameters remain at or below background in the breathing zone for ten minutes or more.

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7.0 SITE CONTROL

7.1 WORK ZONES

Site control will be maintained through the establishment of work zones to prevent exposure to and spread of contamination by activities at the site. Prevention of exposure to and spread of contamination by activities at the site will be achieved through the establishments of work zones. Three work zones will be used: 1) exclusion zone, 2) contaminant reduction zone, and 3) support zone, and flagging tape will be utilized to delineate the different zones, if needed. The line distinguishing the exclusion zone from the contaminant reduction zone is referred to as the hot line, and the line distinguishing the contaminant reduction zone from the support zone is referred to as the contamination control line. The establishment of the work zones (and control lines) will be determined by the SSO, as not all work activities will require an exclusion or contaminant reduction zone.

The exclusion zone is the area where physical or chemical hazards are potentially present. The exclusion zone also includes areas in the immediate vicinity of heavy equipment. The purposes of specifying this zone are to limit the spread of contaminants to clean areas and provide for the safety of those persons not authorized to enter the zone. Only properly trained individuals who are wearing appropriate personal protection equipment and are authorized entry by the SSO will be allowed to work in this zone.

The corridor between the exclusion zone and the support zone is the contamination reduction zone. This area will be established if site conditions dictate that Level D protection may be upgraded to Level C. The contamination reduction zone serves as a buffer to further reduce the possibility of the support zone becoming contaminated. It provides additional assurance that the physical transfer of contaminated substances onto people, equipment, or in the air is limited through a combination of decontamination, distance between exclusion and support zones air dilution, zone restrictions, and work functions. The corridor will contain decontamination stations as described in Section 5.4, Decontamination Procedures.



The support zone is defined as the area outside the zone of potential contamination. The support zone is the staging area for project related personnel, material, and equipment proximate to the area of field operations. In addition, the area serves as a storage area for uncontaminated safety and work equipment. Finally, this zone is used as an area for rest breaks, the consumption of food and beverage, and all activities that serve in a supportive role to the personnel.

7.2 SITE VISITOR PROTECTION

Visitors to the site will be instructed to remain outside of the work area. Visitors will be cautioned to avoid skin contact with contaminated or suspected contaminated surfaces. During visitation, hand-to-mouth transfers will be reduced with special precautions not to eat, drink, smoke, or chew gum or tobacco. The use of alcohol prior to or during site visitation is prohibited. Authorized visitors on medication should request prior approval from the acting SSO before entering the site.

Authorized visitors requiring observation of the field activities must read the HSP and sign a form stating that they have read and understand the safety protocol and will abide by it. This form will also be used as a log form to document that a visitor is on-site. Any visitors entering the work area must wear the appropriate personal protective equipment. Should respiratory protective devices be necessary (Level C), visitors who require entrance to the work area must produce evidence that they have had a complete physical examination, have received respiratory protection training, and have been certified by a physician to use a respirator. Visitors entering the exclusion zone or the contaminant reduction zone must also have been fit-tested for respirator use. Visitor inspection of the exclusion zone or the contaminant reduction zone will be done under the approval of the SSO.



8.0 SAFE WORK PRACTICES

8.1 GENERAL WORK RULES

General safe work practices to be followed by field personnel are presented below.

- Field work will be conducted only during daylight hours unless adequate artificial lighting is provided.
- Eating, drinking, chewing of gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in any work area. The entire body should be washed thoroughly as soon as possible after leaving the work site.
- No excessive facial hair, which interferes with a satisfactory fit of the mask-to-face seal, is allowed on personnel required to wear respiratory protective equipment.
- All personnel assigned for on-site activities will be adequately trained and thoroughly briefed on anticipated hazards, equipment to be worn, safety practices to be followed, emergency procedures, and communications.
- Field personnel must observe each other for signs of toxic exposure and heat/cold illness. Indications of adverse effects include, but are not limited to:
 - Changes in complexion and skin discoloration;
 - Changes in coordination;
 - Changes in demeanor;
 - Excessive salivation and papillary response; or
 - Changes in speech pattern.
- Personnel must also be conscious of non-visual effects of illness such as headaches, dizziness, nausea, blurred vision, cramps, or irritation of eyes, skin, or respiratory tract.
- If any conditions of explosivity or unusual conditions are observed, exit immediately and contact the SSO or Geraghty & Miller Project Manager.



8.2 DRILLING OPERATIONS SAFETY

Drill rig setup and operation can pose many hazards. The drill crew is generally responsible for the safe operation of the drill rig; however, Geraghty & Miller personnel must be aware of safety considerations. To minimize the hazards associated with drilling operations, the following practices should be avoided:

- Standing too close to the rig, especially its moving parts.
- Standing near pipe hoist or rig exhaust.
- Walking on drilling rods or casing, or near the edge of a mud pit.
- Climbing on rig to take pictures.
- Refueling an engine while it is still running or hot.
- Wearing loose fitting clothing.

8.3 SOIL VAPOR SAMPLING SAFETY

Soil samples will be collected during the course of the investigation as described in the Work Plan. Project personnel should take precaution to avoid inhalation exposure at all sample locations.

During sampling activities, smoking, chewing, or eating shall be prohibited. Breathing zone monitoring equipment shall be used to determine airborne concentrations of VOCs. Surgical or nitrile gloves should be worn during all routine sampling tasks.



9.0 EMERGENCY PROCEDURES

In the event of an injury, the SSO will evaluate the nature of the injury, initiate appropriate first aid, and contact the hospital or an ambulance if required. No person may re-enter the work area until the cause of the injury or symptoms is determined. The SSO will complete an accident report following the treatment of the injury.

9.1 EMERGENCY PHONE NUMBERS AND HOSPITAL LOCATION

Emergency phone numbers are provided in Table 1. Written directions St. Francis Hospital are provided in Table 2, and a map with the route to the hospital is shown on Figure 3. St. Francis Hospital is sufficiently staffed and equipped to handle emergency medical cases involving hazardous or toxic substances. The SSO will be responsible for making all field personnel familiar with the location of the hospital, and knowing where the emergency phone list and directions to the hospital are located. Prior to commencement of the field activities, the SSO will locate the nearest telephone or have access to a portable telephone. The field team will be informed of the location and directions to this phone.

9.2 PERSONNEL INJURY IN THE EXCLUSION ZONE

In the event of an injury in the exclusion zone, all site personnel shall assemble at the contamination control line. The SSO will evaluate the nature of the injury, and the affected person should be decontaminated to the extent possible prior to the movement to the support zone. Appropriate first-aid should be initiated, and contact should be made for an ambulance and with St. Francis Hospital (if necessary). No persons shall reenter the exclusion zone until the cause of the injury or symptoms are determined.



9.3 PERSONNEL INJURY IN THE SUPPORT ZONE

Upon notification of an injury on the support zone, the Geraghty & Miller Project Manager and SSO will assess the nature of the injury. If the cause of the injury or loss of the injured person does not affect the performance of site personnel, operations may continue; the appropriate first-aid and necessary follow-up as stated above should be initiated.

9.4 FIRE/EXPLOSION EMERGENCY PROCEDURES

Fire hazards may exist during field activities. The field team will be prepared to put out small fires with an extinguisher and immediately report the incident to the Geraghty & Miller Project Manager. In the event of a large fire, the field team will contact the appropriate authorities and report the fire. Upon notification of a fire or explosion on the site, all personnel will assemble at the contamination control line or other safe area. The Chicago Fire Department shall be alerted and all personnel moved to a safe distance from the involved area.

The SSO will check to see that each vehicle and drilling rig fire extinguisher is appropriate for the fire hazard presented by this project. Generally, Type A, B and C extinguishers are appropriate.

The SSO will take the following action in the event of a fire:

- Notify all site personnel and appropriate authorities that a fire exists.
- Shutdown site activities.
- Account for all site workers.
- Evacuate the site if necessary.

9.5 PERSONAL PROTECTIVE EQUIPMENT FAILURE

All personnel will work with a partner in the exclusion zone. If any site worker experiences a failure or alteration of protective equipment that affects the protection factor, that



person and his/her partner shall immediately leave the exclusion zone. Reentry shall not be permitted until the equipment has been repaired/replaced.

9.6 GENERAL ON-SITE FIRST-AID

- **Contaminated materials get into eyes** - Wash eyes with copious amounts of water for at least 15 minutes. Lift upper and lower lids occasionally. Seek medical attention immediately.
- **Contaminated materials contact skin** - Promptly wash area with soap or mild detergent and water. Flush well with water. Check for signs of skin irritation. Seek medical attention if unusual appearance or skin sensation is noted.
- **Contaminated materials penetrate protective clothing** - Discard protective clothing. Wash skin as described above. Confer with Site Safety Officer in selection of new protective clothing.
- **Inhalation of contaminated air** - Move person to well-ventilated area at once. If individual is not noticeably overcome, and has no side effects after about five minutes, return to work is allowed.
- **Ingestion of contaminated materials** - Flush mouth with water, being careful not to swallow. Contact local poison center. When called for, induce vomiting. (DO NOT induce vomiting in unconscious persons). Seek medical attention promptly.

9.7 EMERGENCY COMMUNICATIONS

Verbal communications may be difficult at times due to personal protective equipment and noise. A universal set of hand signals will then be used. They are as follows:

- Hand gripping throat I can't breathe.
- Grip partner's wrist or place hands around waist Leave work area immediately.
- Hands on top of head I need assistance.
- Thumbs up OK. I am all right.
- Thumbs down No. Negative.

A site plan is included as Figure 2 for evacuation or other emergency purposes.



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TABLES



Table 1. Emergency Telephone Numbers,
Former West Pullman Works Site, Chicago, Illinois

Agency	Telephone Number
Hospital St. Francis Hospital 12935 Gregory Blue Island, Illinois	(708) 597-2000
Fire Department Emergency Chicago Fire Department	911 (312) 785-0183
Ambulance Emergency	911
Police Emergency Chicago Police Department	911 (312) 747-8210
Poison Control Center	(800) 632-2727
Geraghty & Miller Physician EMR	(800) 229-3674
Geraghty & Miller, Inc. Chicago, Illinois	(312) 263-6703
Navistar International Transp. Corp. Representative Edith Ardiente	(312) 836-2573



Table 2. Directions to St. Francis Hospital.
Former West Pullman Works Site, Chicago, Illinois

Proceed west on 120th Street towards Interstate-57. Turn right onto Ashland and proceed north to 119th Street. Turn left onto 119th Street and then left onto Interstate-57. Continue south on Interstate-57 and exit west at 127th Street (first exit). Proceed west on 127th Street to Gregory. Turn left (south) onto Gregory. St. Francis Hospital is located at 12935 Gregory (on Gregory between High Street and York). Follow signs to emergency room.

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FIGURES



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FIGURES



Dwg Date: 6/3/96
 Project No.: C10612ca
 File No.: -CAD
 Drawing:
 Checked: J R
 Approved: J AUER
 Drafter: S COONR 1-1



Source: USGS 7.5 Min. Topographic Map, Blue Island, IL Quadrangle, 1963,
 Photorevised 1973 and Photoinspected 1978.



SITE LOCATION MAP
 FORMER WEST PULLMAN WORKS SITE
 CHICAGO, ILLINOIS

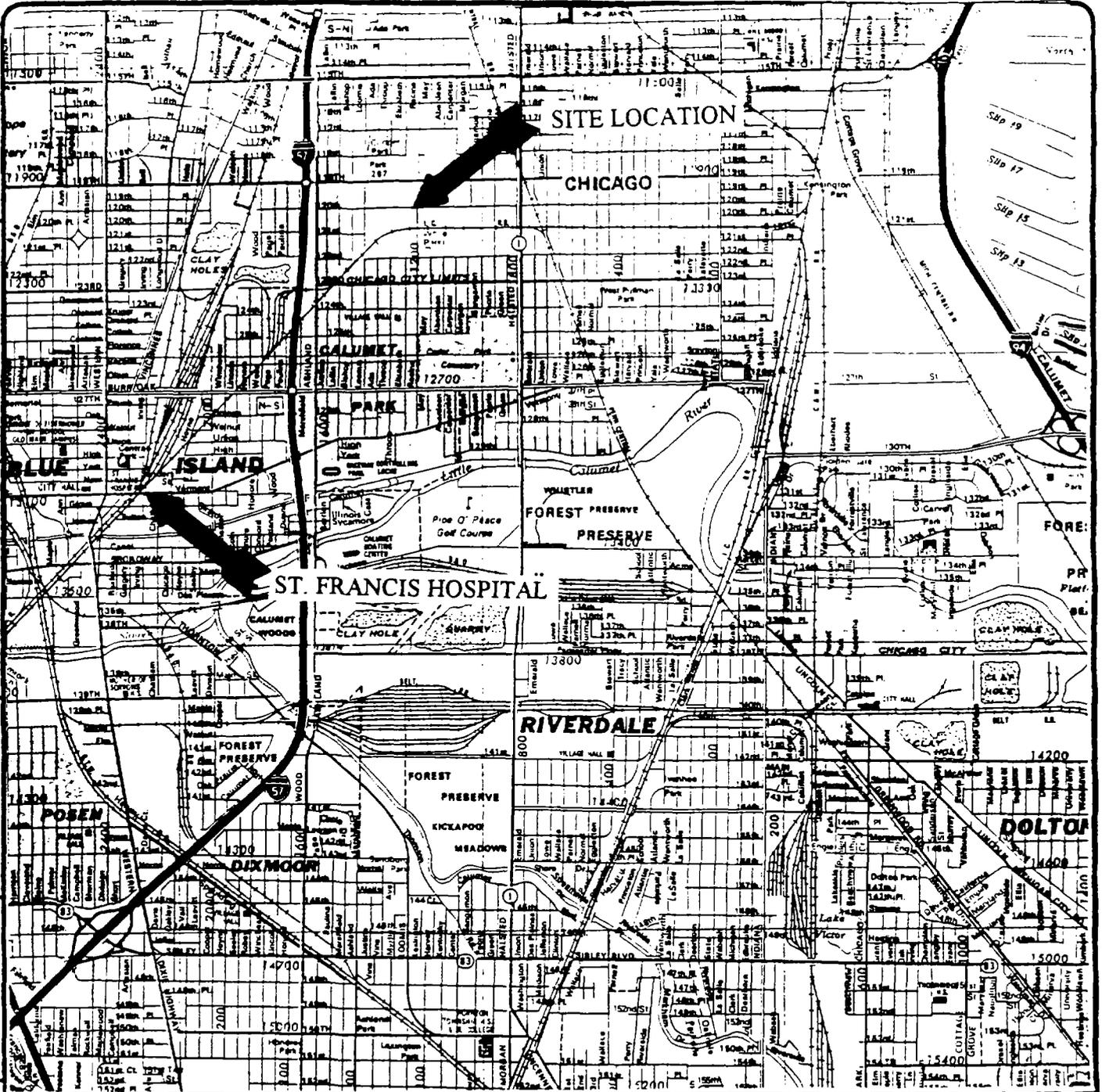
FIGURE
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ATTACHMENTS

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DWG DATE: 3/3/95 | PRJCT NO.: | FILE NO.: NON-CAD | DRAWING: | CHECKED: J AUER | APPROVED: J AUER | DRAFTER: S GOAR 1-1



Source: Chicagoland Atlas, Creative Sales Corporation, 1990.

Proceed west on 120th Street towards Interstate-57. Turn right onto Ashland and proceed north to 119th Street. Turn left onto 119th Street and then left onto Interstate-57. Continue south on Interstate-57 and exit west at 127th Street (first exit). Proceed west on 127th Street to Gregory. Turn left (south) onto Gregory. St. Francis Hospital is located at 12935 Gregory (on Gregory between High Street and York). Follow signs to emergency room.



EMEGENCY ROUTE TO HOSPITAL
FORMER WEST PULLMAN WORK SITE
CHICAGO, ILLINOIS

FIGURE

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ATTACHMENT I
Compound Characteristics

ACETONE

Synonyms:	Dimethyl ketone, Ketone propane, 2-Propanone
Exposure Limits:	250 ppm (TWA)
IDLH Level:	2500 ppm
Physical Description:	Colorless liquid with fragrant, mint-like odor
Personal Protection and Sanitation:	<p>Clothing: Wear appropriate equipment to prevent repeated or prolonged skin contact</p> <p>Goggles: Wear eye protection to prevent reasonable probability of eye contact</p> <p>Wash: Workers should wash promptly when skin becomes wet</p> <p>Remove: Remove clothing immediately if clothing becomes wet (to avoid flammability hazard)</p>
Routes of Entry:	Inhalation, ingestion, skin/eye contact
Symptoms:	Irritated eyes, nose, throat; headache, dizziness; dermatitis
First Aid:	<p>Eyes: Immediately wash eyes with large amounts of water</p> <p>Skin: Immediately wash contaminated skin with soap and water</p> <p>Breathing: Move exposed person to fresh air at once. If breathing has stopped, provide mouth-to-mouth resuscitation. Keep the affected person warm and at rest. Get medical attention as soon as possible.</p>



BENZENE

Synonyms:	Benzol, Phenyl hydride
Exposure Limits:	0.1 ppm (TWA)
IDLH Level:	500 ppm
Physical Description:	Colorless to light-yellow liquid with an aromatic odor; a solid below 42 °F
Personal Protection and Sanitation:	<p>Clothing: Wear appropriate equipment to prevent repeated or prolonged skin contact</p> <p>Goggles: Wear eye protection to prevent reasonable probability of eye contact</p> <p>Wash: Workers should wash promptly when skin becomes wet</p> <p>Remove: Remove clothing immediately if clothing becomes wet (to avoid flammability hazard)</p>
Routes of Entry:	Inhalation, absorption, ingestion, skin/eye contact
Symptoms:	Irritated eyes, skin, nose, respiratory system; giddiness; headache; nausea; staggered gait; fatigue; anorexia; lassitude; dermatitis; bone marrow depression (carcinogen)
First Aid:	<p>Eyes: Immediately wash eyes with large amounts of water</p> <p>Skin: Immediately wash contaminated skin with soap and water</p> <p>Breathing: Move exposed person to fresh air at once. If breathing has stopped, provide mouth-to-mouth resuscitation. Keep the affected person warm and at rest. Get medical attention as soon as possible.</p>



ETHYL BENZENE

Synonyms:	Ethylbenzol, Phenylethane
Exposure Limits:	100 ppm (435 mg/m ³) (TWA)
IDLH Level:	800 ppm
Physical Description:	Colorless liquid with an aromatic odor
Personal Protection and Sanitation:	<p>Clothing: Wear appropriate equipment to prevent repeated or prolonged skin contact</p> <p>Goggles: Wear eye protection to prevent reasonable probability of eye contact</p> <p>Wash: Workers should wash promptly when skin becomes wet</p> <p>Remove: Remove clothing immediately if clothing becomes wet (to avoid flammability hazard)</p>
Routes of Entry:	Inhalation, ingestion, skin/eye contact
Symptoms:	Irritated eyes, skin, mucous membranes; skin burns; respiratory irritation; dermatitis
First Aid:	<p>Eyes: Immediately wash eyes with large amounts of water</p> <p>Skin: Immediately wash contaminated skin with soap and water</p> <p>Breathing: Move exposed person to fresh air at once. If breathing has stopped, provide mouth-to-mouth resuscitation. Keep the affected person warm and at rest. Get medical attention as soon as possible.</p>



METHYLENE CHLORIDE

Synonyms: Dichloromethane, Methylene dichloride

Exposure Limits: 500 ppm (TWA)

IDLH Level: 2300 ppm

Physical Description: Colorless liquid with a chloroform-like odor

Personal Protection and Sanitation:

Clothing: Wear appropriate equipment to prevent repeated or prolonged skin contact

Goggles: Wear eye protection to prevent reasonable probability of eye contact

Wash: Workers should wash promptly when skin becomes wet

Remove: Remove promptly if it is non-impervious clothing when it becomes wet

Routes of Entry: Inhalation, skin absorption, ingestion, skin/eye contact

Symptoms: Irrigated eyes and/or skin, fatigue, weak feeling, sleepiness, light-headedness, numb limbs, tingling sensations, nausea

First Aid: **Eyes:** Immediately wash eyes with large amounts of water

Skin: Immediately wash contaminated skin with soap and water

Breathing: Move exposed person to fresh air at once. If breathing has stopped, provide mouth-to-mouth resuscitation. Keep the affected person warm and at rest. Get medical attention as soon as possible.

Swallow: Get immediate medical attention



TOLUENE

Synonyms:	Methyl benzene, Methyl benzol, Phenyl methane, Toluol
Exposure Limits:	100 ppm (375 mg/m ³) (TWA)
IDLH Level:	500 ppm
Physical Description:	Colorless liquid with a sweet, pungent, benzene-like odor
Personal Protection and Sanitation:	<p>Clothing: Wear appropriate equipment to prevent repeated or prolonged skin contact</p> <p>Goggles: Wear eye protection to prevent reasonable probability of eye contact</p> <p>Wash: Workers should wash promptly when skin becomes wet</p> <p>Remove: Remove clothing immediately if clothing becomes wet (to avoid flammability hazard)</p>
Routes of Entry:	Inhalation, skin absorption, ingestion, skin/eye contact
Symptoms:	Irritated eyes, nose; fatigue, weakness; confusion; euphoria, dizziness; headache; dilated pupils; lacrimation; nervousness; muscle fatigue; insomnia; paresthesia; dermatitis
First Aid:	<p>Eyes: Immediately wash eyes with large amounts of water</p> <p>Skin: Immediately wash contaminated skin with soap and water</p> <p>Breathing: Move exposed person to fresh air at once. If breathing has stopped, provide mouth-to-mouth resuscitation. Keep the affected person warm and at rest. Get medical attention as soon as possible.</p> <p>Swallow: Get immediate medical attention</p>



ASBESTOS

Synonyms:	Acrinolite, actinolite asbestos, amosite, anthophyllite, anthophyllite asbestos, chrysotile, crocidolite, riebeckite, tremolite, tremolite asbestos
Exposure Limits:	100,000 fibers per cubic meter of air (REL) (as determined by a 400-liter air sample collected over 100 minutes and NIOSH Analytical Method #7400)
IDLH Level:	N.A.
Physical Description:	White or greenish (chrysotile), blue (crocidolite), or gray-green (amosite) fibrous, odorless solids
Personal Protection and Sanitation:	<p>Clothing: Wear appropriate equipment to prevent repeated or prolonged skin contact.</p> <p>Goggles: Wear eye protection to prevent reasonable probability of eye contact.</p> <p>Wash: Workers should wash skin daily.</p>
Routes of Entry:	Inhalation, ingestion, skin/eye contact
Symptoms:	Irritated eyes, dyspnea (breathing difficulty), interstitial fibrosis, restricted pulmonary function, finger clubbing, asbestosis (chronic exposure)
First Aid:	<p>Eyes: Immediately wash eyes with large amounts of water.</p> <p>Breathing: Move exposed person to fresh air at once.</p>



XYLENES

Synonyms:	o: 1,2-Dimethylbenzene; o-Xylol m: 1,3-Dimethylbenzene; m-Xylol p: 1,4-Dimethylbenzene; p-Xylol
Exposure Limits:	100 ppm (435 mg/m ³) (TWA)
IDLH Level:	900 ppm
Physical Description:	Colorless liquids with an aromatic odor; pure p-xylene is a solid below 56 °F
Personal Protection and Sanitation:	<p>Clothing: Wear appropriate equipment to prevent repeated or prolonged skin contact</p> <p>Goggles: Wear eye protection to prevent reasonable probability of eye contact</p> <p>Wash: Workers should wash promptly when skin becomes wet</p> <p>Remove: Remove clothing immediately if clothing becomes wet (to avoid flammability hazard)</p>
Routes of Entry:	Inhalation, skin absorption, ingestion, skin/eye contact
Symptoms:	Dizziness, excitement, drowsiness, poor coordination, staggering gait; irritation of eyes, nose, and throat; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis
First Aid:	<p>Eyes: Immediately wash eyes with large amounts of water</p> <p>Skin: Immediately wash contaminated skin with soap and water</p> <p>Breathing: Move exposed person to fresh air at once. If breathing has stopped, provide mouth-to-mouth resuscitation. Keep the affected person warm and at rest. Get medical attention as soon as possible.</p> <p>Swallow: Get immediate medical attention</p>



CADMIUM

Synonyms:	Synonyms vary depending upon specific compound.
Threshold Limit Value (TLV):	0.05 mg/m ³
IDLH Level:	Not available.
Physical Description:	Appearance and odor vary for specific compound.
Personal Protection and Sanitation:	Clothing: N.A.
	Goggles: Wear eye protection to prevent any possibility of eye contact.
	Wash: At the end of each work shift when there is reasonable probability of contact with the contaminant.
	Change: If there is any possibility that the clothing may be contaminated.
	Routes of Entry: Inhalation, ingestion.
Symptoms:	Cough, tight chest, headache.
First Aid:	Eyes: Immediately wash the eyes with large amounts of water. Get medical attention immediately.
	Skin: Wash the contaminated skin with soap and water.
Target Organs:	Breath: Artificial respiration.
	Swallow: Get medical attention immediately.
	Respiratory system, kidneys, prostate, blood.



CHROMIUM

Synonyms:	Synonyms vary depending upon specific chromium compound
Exposure Limits:	Cr (II) 0.5 mg/m ³ (TWA) Cr (III) 0.5 mg/m ³ (TWA)
IDLH Level:	Cr (II) 250 mg/m ³ (TWA) Cr (III) 25 mg/m ³ (TWA)
Physical Description:	Appearance and odor vary depending upon specific chromium compound
Personal Protection and Sanitation:	<p>Clothing: Wear appropriate equipment to prevent repeated or prolonged skin contact</p> <p>Goggles: Wear eye protection to prevent reasonable probability of eye contact</p> <p>Wash: Workers should wash promptly when skin becomes contaminated</p> <p>Remove: Remove clothing immediately if clothing becomes wet or contaminated</p>
Routes of Entry:	Inhalation, ingestion, skin/eye contact
Symptoms:	Irritated eyes, nose; sensitization dermatitis
First Aid:	<p>Eyes: Immediately wash eyes with large amounts of water</p> <p>Skin: Immediately wash contaminated skin with soap and water</p> <p>Breathing: Move exposed person to fresh air at once. If breathing has stopped, provide mouth-to-mouth resuscitation. Keep the affected person warm and at rest. Get medical attention as soon as possible.</p> <p>Swallow: Get immediate medical attention</p>



COPPER

Synonyms:	Copper metal dusts, copper metal mists
Exposure Limits:	1 mg/m ³ (TWA)
IDLH Level:	100 mg/m ³
Physical Description:	Reddish, lustrous, malleable, odorless solid
Personal Protection and Sanitation:	<p>Clothing: Wear appropriate equipment to prevent repeated or prolonged skin contact</p> <p>Goggles: Wear eye protection to prevent reasonable probability of eye contact</p> <p>Wash: Workers should wash promptly when skin becomes contaminated</p> <p>Remove: Remove clothing immediately if clothing becomes wet or contaminated</p>
Routes of Entry:	Inhalation, ingestion, skin/eye contact
Symptoms:	Irritated eyes, nose, pharynx; nasal perforation; metallic taste; dermatitis
First Aid:	<p>Eyes: Immediately wash eyes with large amounts of water</p> <p>Skin: Immediately wash contaminated skin with soap and water</p> <p>Breathing: Move exposed person to fresh air at once. If breathing has stopped, provide mouth-to-mouth resuscitation. Keep the affected person warm and at rest. Get medical attention as soon as possible.</p> <p>Swallow: Get immediate medical attention</p>



CYANIDE

Synonyms:	Potassium cyanide, sodium cyanide.
Threshold Limit Value (TLV):	5 mg/m ³
IDLH Level:	50 mg/m ³
Physical Description:	White solids with a faint almond odor.
Personal Protection and Sanitation:	Clothing: Wear appropriate equipment to prevent any possibility of skin contact.
	Goggles: Wear eye protection to prevent any possibility of eye contact.
	Wash: Immediately when skin becomes contaminated, and at the end of each work shift.
	Change: Clothing should be changed daily if there is any possibility of contamination.
	Remove: Immediately remove any clothing that becomes contaminated.
	Provide: Eye wash station and quick drench station.
Routes of Entry:	Inhalation, absorption, ingestion.
Symptoms:	Asphyxia, headache, confusion, nausea, vomiting, eye, skin irritation.
First Aid:	Breath: Artificial respiration.
	Eye: Irrigate immediately.
	Skin: Wash immediately with soap.
	Swallow: Get medical attention immediately.
Target Organs:	Central nervous system, liver, kidneys, skin.



LEAD

Synonyms: Lead metal, plumbum

Exposure Limits: 0.100 mg/m³ (TWA)

IDLH Level: 100 mg/m³

Physical Description: A heavy, ductile, soft, gray solid.

Personal Protection and Sanitation:

Clothing: Wear appropriate equipment to prevent repeated or prolonged skin contact

Goggles: Wear eye protection to prevent reasonable probability of eye contact

Wash: Workers should wash daily at the end of the work shift.

Remove: Remove clothing immediately if clothing becomes wet or contaminated

Routes of Entry: Inhalation, skin absorption, ingestion, skin/eye contact

Symptoms: Weakness, lassitude, insomnia, facial pallor, anorexia, weight loss, malnutrition, constipation, abdominal pain, colic, anemia, gingival lead line, tremor, wrist paralysis, ankle paralysis, encephalopathy, kidney disease, irritated eyes, hypotension

First Aid:

Eyes: Immediately wash eyes with large amounts of water

Skin: Immediately wash contaminated skin with soap and water

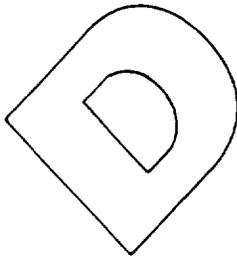
Breathing: Move exposed person to fresh air at once. If breathing has stopped, provide mouth-to-mouth resuscitation. Keep the affected person warm and at rest. Get medical attention as soon as possible.

Swallow: Get immediate medical attention



NICKEL

Synonyms:	Nickel metal, elemental metal, nickel catalyst
Exposure Limits:	0.015 mg/m ³ (TWA)
IDLH Level:	10 mg/m ³
Physical Description:	Metal: Lustrous, silvery, odorless solid
Personal Protection and Sanitation:	<p>Clothing: Wear appropriate equipment to prevent repeated or prolonged skin contact</p> <p>Goggles: No recommendation made</p> <p>Wash: Workers should wash promptly when skin becomes wet and daily and the end of the work shift</p> <p>Remove: Remove clothing immediately if clothing becomes wet or contaminated</p>
Routes of Entry:	Inhalation, skin absorption, ingestion, skin/eye contact
Symptoms:	Sensitization dermatitis, allergic asthma, pneumitis
First Aid:	<p>Skin: Immediately wash contaminated skin with soap and water</p> <p>Breathing: Move exposed person to fresh air at once. If breathing has stopped, provide mouth-to-mouth resuscitation. Keep the affected person warm and at rest. Get medical attention as soon as possible.</p> <p>Swallow: Get immediate medical attention</p>



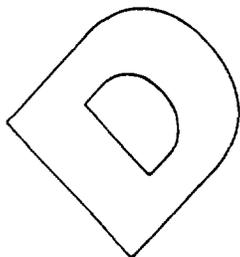
SULFURIC ACID

Synonyms:	Battery acid, Hydrogen sulfate, Oil of vitriol
Exposure Limits:	1 mg/m ³ (TWA)
IDLH Level:	15 mg/m ³
Physical Description:	Colorless to dark brown, oily, odorless liquid. Pure compound is a solid below 51 °F
Personal Protection and Sanitation:	<p>Clothing: Wear appropriate equipment to prevent repeated or prolonged skin contact</p> <p>Goggles: Wear eye protection to prevent reasonable probability of eye contact</p> <p>Wash: Workers should wash promptly when skin becomes contaminated</p> <p>Remove: Remove clothing immediately if clothing becomes wet or contaminated</p>
Routes of Entry:	Inhalation, ingestion, skin/eye contact
Symptoms:	Irritated eyes, nose, throat; pulmonary edema, bronchitis, emphysema; conjunctivitis, stomatis, dental erosion, tracheobronchitis, eye burns, skin burns, dermatitis
First Aid:	<p>Eyes: Immediately wash eyes with large amounts of water</p> <p>Skin: Immediately wash contaminated skin with soap and water</p> <p>Breathing: Move exposed person to fresh air at once. If breathing has stopped, provide mouth-to-mouth resuscitation. Keep the affected person warm and at rest. Get medical attention as soon as possible.</p> <p>Swallow: Get immediate medical attention</p>



OLEUM

Synonyms:	Fuming sulfuric acid, disulfuric acid
Threshold Limit Value (TLV):	1 mg/m ³
Physical Description:	Colorless viscous liquid; choking fumes of sulfur trioxide
Personal Protection and Sanitation:	<p>Clothing: Protective suit and neoprene gloves, at a minimum, are recommended.</p> <p>Goggles: Wear eye protection to prevent any possibility of eye contact.</p>
Routes of Entry:	Inhalation, ingestion, eye contact, skin contact.
Symptoms:	Irritation to respiratory system, severe burns, nausea, vomiting, kidney and lung damage.
First Aid:	<p>Eyes: Immediately wash the eyes with large amounts of water for at least 15 minutes. Get medical attention immediately.</p> <p>Skin: Wash the contaminated skin.</p> <p>Breath: Artificial respiration or oxygen.</p> <p>Swallow: Give water, milk or milk of magnesia. Get medical attention immediately.</p>
Target Organs:	Respiratory system, kidneys, prostate, blood.



POLYCHLORINATED BIPHENYLS

Synonyms: PCBs, chlorodiphenyl, chlorinated biphenyls, polychlorbiphenyls, Aroclor®, Kanechlor, Clophen

Exposure Limits: 0.001 mg/m³ (TWA)

IDLH Level: 5 mg/m³

Physical Description: Colorless to light-colored, viscous liquid with a mild, hydrocarbon odor

Personal Protection and Sanitation:

Clothing: Wear appropriate equipment to prevent repeated or prolonged skin contact

Goggles: Wear eye protection to prevent reasonable probability of eye contact

Wash: Workers should wash promptly when skin becomes contaminated

Remove: Remove clothing immediately if clothing becomes wet or contaminated

Routes of Entry: Inhalation, skin absorption, ingestion, skin/eye contact

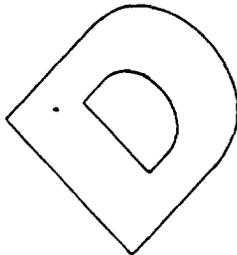
Symptoms: Irritated eyes, chloracne, liver damage, reproductive effects

First Aid: **Eyes:** Immediately wash eyes with large amounts of water

Skin: Immediately wash contaminated skin with soap and water

Breathing: Move exposed person to fresh air at once. If breathing has stopped, provide mouth-to-mouth resuscitation. Keep the affected person warm and at rest. Get medical attention as soon as possible.

Swallow: Get immediate medical attention



ATTACHMENT 2
Geraghty & Miller Respiratory Protection Program

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RESPIRATORY PROTECTION PROGRAM
29 CFR 1910.134

OVERVIEW

This respiratory protection program has been developed to educate and train our employees in the proper use and selection of respiratory protective equipment in order to minimize inhalation hazards resulting from various field tasks. It provides a step-by-step approach along with the recordkeeping requirements.

REGULATORY GUIDANCE

This procedure has been developed in accordance with the OSHA Title 29, Code of Federal Regulations 1910.134, "Respiratory Protection" and the National Institute of Occupational Health and Safety, NIOSH, "Guide to Industrial Respiratory Protection."

PERTINENT ISSUES

The preferred methods of protection are engineering controls and work practices. When these methods cannot reduce the hazard that an employee faces, respirators and other personal protective equipment must then be used. Respirators must not be worn when conditions, such as a growth of beard, sideburns, or temple pieces on glasses, prevent a good face seal. The employee's diligence in observing these factors is required. Any changes, such as recent dental work, which the employee feels could prevent a good face seal, should be reported to the office health and safety manager. A fit test procedure should be carried out to confirm the effect of these changes. A fit test must be conducted, as a minimum, every 3 years when no changes have occurred and a record must be kept of the fit test. A fit test form and a copy of the fit test procedure are included in this section.

Employees shall be properly instructed and trained in the proper use of respirators and their limitations. This training is provided in Geraghty & Miller's 40-hour health and safety training for hazardous waste activities, the annual 8-hour refresher training, and the 8-hour managers and supervisor training, which our field personnel attend as requested by OSHA 29 CFR 1910.120, "Hazardous Waste Activities and Emergency Response."



Respirators will be regularly cleaned and disinfected, after each day's use, or as often as necessary. The health and safety manager will designate an area for the cleaning and maintenance procedure. All necessary cleaning solutions will be provided.

All employees who have been issued respirators must participate in the medical surveillance program. They will not be assigned to tasks requiring the use of a respirator unless the attending physician has determined that they are physically capable.

Fit Testing/Checking Procedure:

1. Respirators should be physically inspected prior to being worn. A respirator inspection record which provides a list of items to check, is attached. If any defects are found, the respirator should not be worn until the defective part(s) has been replaced. (Parts are not interchangeable between brands).
2. Negative pressure check. This check consists of closing off all inlets, canisters, cartridges, and filters, or closing off the breathing tube so that it does not pass air. Inhale gently and hold for 10 seconds. The face piece should remain slightly collapsed with no inward leakage detectable.
3. Positive pressure check. Similar to the negative pressure checks, this check is conducted by closing off the exhalation valve. By exhaling, a slight positive pressure should build up inside the face piece without any evidence of outward leakage. The negative and positive pressure checks must be conducted every time a respirator is worn. Once this is completed, the respirator should be worn for approximately 10 minutes prior to the testing phase. Then steps 4 through 8 should be completed.
4. Normal breathing tests. Breathe regularly through the respirator.
5. Deep breathing tests. Be certain that breaths are deep and regular.
6. Turning head from side to side. Be certain movement is complete. Alert the test subject not to bump the respirator on the shoulders. Have the test subject inhale when his/her head is at either side.



7. Nodding head up and down. Be certain motions are complete and made about every second. Alert the test subject not to bump the respirator on the chest. Have the test subject inhale when his/her head is in the fully up position.
8. Talking. Talk loudly and slowly for several minutes. The Rainbow Passage has been included with this program. Reading it will result in a wide range of facial movements, and thus be useful to satisfy this requirement.

Qualitative Fit Test:

Steps 4 through 8 should then be repeated in conjunction with Isoamyl Acetate (Banana Oil) for odor threshold detection or irritation. An alternative method is to use irritant smoke to detect breakthrough/leakage.

GERAGHTY & MILLER POLICY

Employees required to wear respirators cannot wear beards or mustaches that will interfere with the fit. Every new respirator must be fit tested to the individual. Respirators will be issued to individual employees during field work when they may be exposed to inhalation hazards. Respirators will be selected based on the hazards that may be present. The selection of the proper respirator will be made by the office health and safety manager and/or the regional health and safety manager. Only Mine Safety and Health Administration (MSHA)/NIOSH-certified respirators will be selected. Due to the nature of our business, the selection of the proper respirator can vary from site to site. For this reason, a systematic approach has been incorporated to assist in the selection process. The NIOSH respirator decision logic flow chart has been included for guidance. In step 4 of the NIOSH respirator decision logic flow chart, it states that workers must be protected from potential exposures to carcinogens through the use of supplied air respirators such as air-line or self contained breathing apparatus. This guidance will be followed in most cases except for those compounds which have specific OSHA standards and respiratory protection requirements. A list of these compounds along with a reference to the applicable standard has been included.



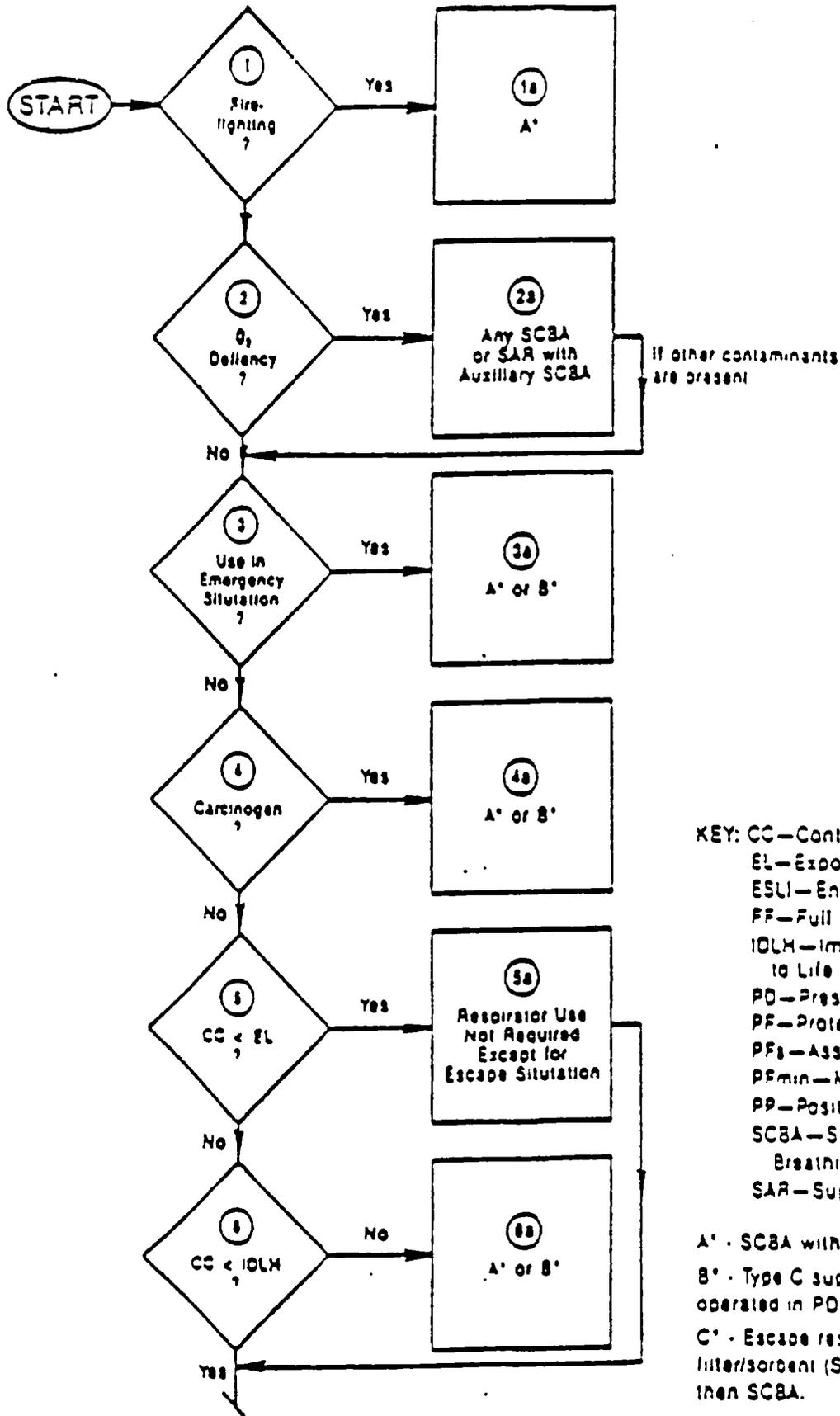
In the selection of air purifying respirators (APRs), full face respirators provide a greater degree of protection. For cartridge selection, use the NIOSH Chart. For all Level B work, the regional health and safety manager must be contacted. The regional health and safety manager will audit the program annually.



<u>Compounds</u>	<u>29 CFR</u>
Asbestos	1910.1001
4-Nitrobiphenol	1910.1003
Alpha-Naphthylamine	1910.1004
Methyl-Chloromethyl Ether	1910.1006
3,3-Dichlorobenzidine (+ salts)	1910.1007
Bis-Chloromethyl Ether	1910.1008
Beta-Naphthylamine	1910.1009
Benzidine	1910.1010
4-Aminodiphenyl	1910.1011
Ethyleneimine	1910.1012
Beta-Propiolactone	1910.1013
2-Acetylaminofluorene	1910.1014
4-Dimethylaminoazobenzene	1910.1015
N-Nitrosodimethylamine	1910.1016
Vinyl Chloride	1910.1017
Inorganic Arsenic	1910.1018
Lead	1910.1025
Benzene	1910.1028
Coke Oven Emissions	1910.1029
Cotton Dust	1910.1043
1,2-Dibromo-3-Chloropropane	1910.1044
Acrylonitrile	1910.1045
Ethylene Oxide	1910.1047
Formaldehyde	1910.1048



NIOSH RESPIRATOR DECISION LOGIC - FLOW CHART

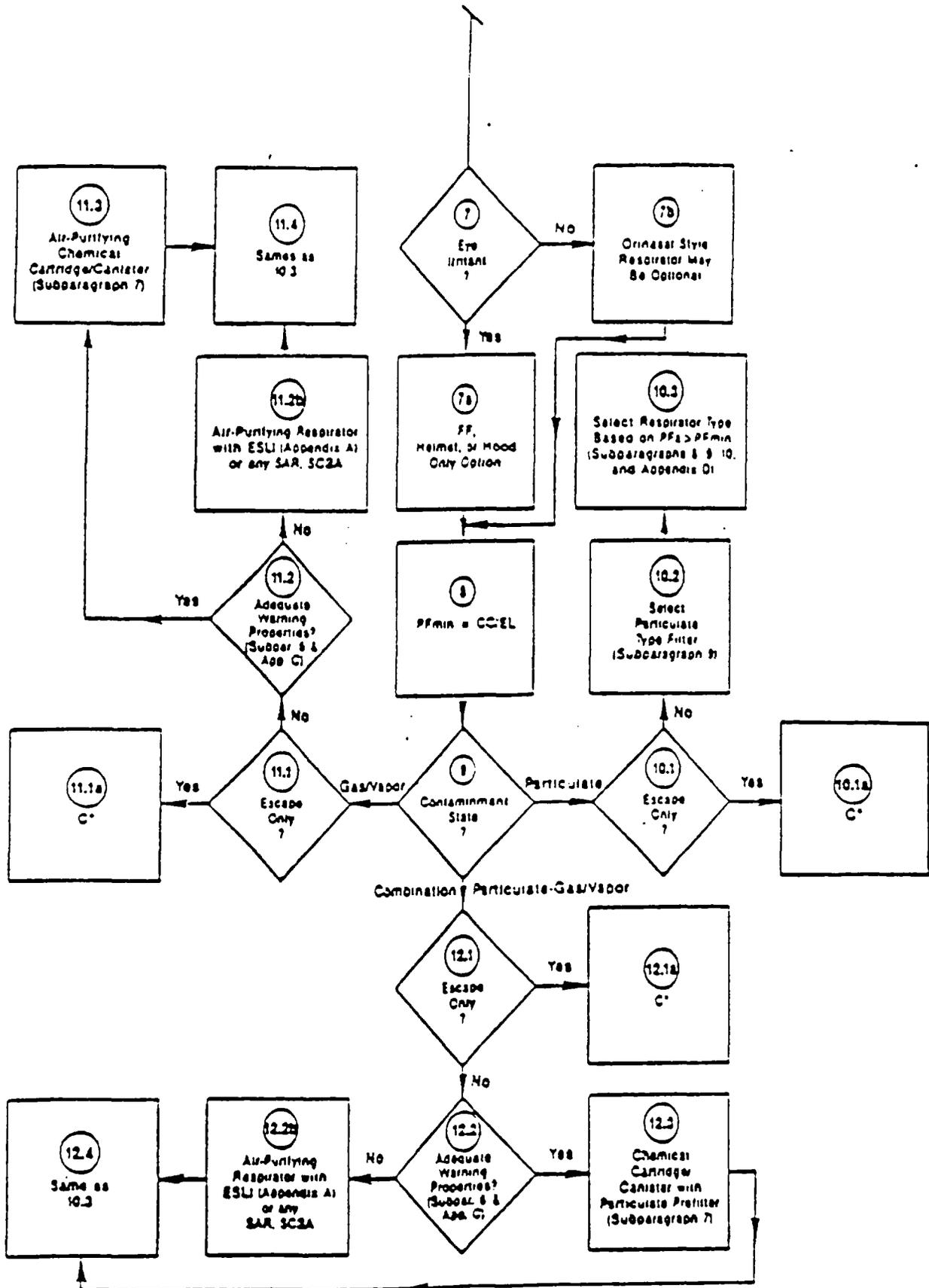


KEY: CC—Contaminant Concentration
 EL—Exposure Limit
 ESLI—End of Service Life Indicator
 FF—Full Facepiece
 IDLH—Immediately Dangerous to Life or Health
 PD—Pressure Demand
 PF—Protection Factor
 PFs—Assigned PF
 PFmin—Minimum PF
 PP—Positive Pressure
 SCBA—Self-Contained Breathing Apparatus
 SAR—Supplied-Air Respirator

A* - SCBA with FF operated in PD or PP mode.
 B* - Type C supplied-air respirator (airline) operated in PD or PP mode with auxiliary SCBA.
 C* - Escape respirator or gas mask with appropriate filter/sorbent (Subparagraph 5); if O₂ deficient, then SCBA.



NIOSH RESPIRATOR DECISION LOGIC - FLOW CHART (Continued)



RAINBOW PASSAGE

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white lights into many beautiful colors. These take the shape of long, round arc, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for a pot of gold at the end of the rainbow.

